"Decision-Making with Climate Models"

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Abstract

Climate models are widely used to make forecasts, which provide the basis for far-reaching policy decisions. However, upon closer examination it turns out that climate models do not actually warrant the probabilistic forecasts that are commonly derived from them: due to their intrinsic imperfection and nonlinearity, they cannot be used to calculate decision-relevant probabilities. Although the IPPC has recognised this fact, no research in to other methods of prediction has been carried out. It is the aim of an ongoing project to address this issue by first investigating how and why exactly probabilistic predictions break down in climate models, and then develop alternative methods to get around the problem. The proposal is that probabilistic reasoning should be given up altogether. Models should be used to calculate nonprobabilistic odds for certain events, and these should be used to guide decision making. We introduce both the problem and the proposal and illustrate it with a simple example.